

Agent X Description - 2021 AI Birds Competition

Agent X is a fork of Bamberg University's Bambirds agent which previously won the 2019 IJCAI Competition. The new additions introduced by Agent X mainly focused on enhancing shot selection and level selection by using a few simple techniques to find a better balance between exploration and exploitation. One key adjustment that was made changed the probability distribution for shot selection, allowing the agent to randomly select between a group of similarly evaluated options. This provides some increased robustness against differences between the predicted score and the actual achieved score, because the agent is more likely to try something new instead of committing to similar shots that may suffer a similar disparity between the predicted score and actual score. The agent doesn't necessarily make better predictions about the success of an individual shot, but is just able to better adjust to new information that contrasts earlier predictions. The other main area of change focuses on choosing which level to retry, favouring levels that are yet to be completed rather than optimising levels already solved. This is done by changing the evaluation function that generates the expected improvement of each level. This also sets a bound on the predictions of how much additional score can be achieved for each level, contributing to the probability that an uncompleted level is selected. After some experimentation and tuning of other parameters tested on the 2019 grand final levels, Agent X was able to consistently achieve $>50\%$ extra total score compared to the 2019 Bambirds champion.